FORM-PTO-1390 (Rev. 12-29-99) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 003300-852

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5): unassigned 09/937851

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/SE00/00597	28 March 2000	29 March 1999

TITLE OF INVENTION: A PROCESS FOR STERILIZING A BIOLOGICALLY CONTAMINATED ENCLOSURE

APPLICANT(S) FOR DO/EO/US: SHOAA ABDUL RAHMAN and RAÁFAT KITTANEH

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (Signed Declaration will follow).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

    A certified copy of Swedish Application No. 9901137-1, filed 29 March 1999, was submitted during the international phase of the examination. Thus, the claim for priority has been perfected.

410 Rec'd PCT/PTO 28 SEP 2001

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
unassigned 09/937851	PCT/SE00/00597	003300-852

17. ☒ The following fees are submitted:	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1,000.00 (960)		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $860.00 (970)		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $710.00 (958)		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) $690.00 (956)		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00 (962)		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 1,000.00	
Surcharge of **$130.00 (154)** for furnishing the oath or declaration later than 20 ☐ 30 ☐ months from the earliest claimed priority date (37 CFR 1.492(e)).	$ --	

Claims	Number Filed	Number Extra	Rate		
Total Claims	20 -20 =	0	X$18.00 (966)	$ --	
Independent Claims	1 -3 =	0	X$80.00 (964)	$ --	
Multiple dependent claim(s) (if applicable)			+$270.00 (968)	$ --	
TOTAL OF ABOVE CALCULATIONS =				$ 1,000.00	
Reduction for 1/2 for filing by small entity, if applicable (see below).				$ 500.00	-
SUBTOTAL =				$ 500.00	
Processing fee of **$130.00 (156)** for furnishing the English translation later than 20 ☐ 30 ☐ months from the earliest claimed priority date (37 CFR 1.492(f)). +				$ --	
TOTAL NATIONAL FEE =				$ 500.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00 (581)** per property +				$ --	
TOTAL FEES ENCLOSED =				$ 500.00	
				Amount to be: refunded	$
				charged	$

a. ☒ Small entity status is hereby claimed.

b. ☒ A check in the amount of $ 500.00 to cover the above fees is enclosed.

c. ☐ Please charge my Deposit Account No. 02-4800 in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

d. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Benton S. Duffett, Jr.
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Filed: September 28, 2001

Benton S. Duffett, Jr.
SIGNATURE

Benton S. Duffett, Jr.
NAME

22,030
REGISTRATION NUMBER

Patent
Attorney's Docket No. 003300-852

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
	)	
SHOAA ABDUL RAHMAN et al.	)	Group Art Unit: (unassigned)
	)	
Application No.: (unassigned)	)	Examiner: (unassigned)
	)	
Filed: September 28, 2001	)	
	)	
For: A PROCESS FOR STERILIZING A BIOLOGICALLY CONTAMINATED ENCLOSURE	)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This is a national phase application of International Application No. PCT/SE00/00597, filed March 28, 2001.

Please amend the Application as indicated.

IN THE ABSTRACT:

Please add the Abstract of the Disclosure that is provided on a separate sheet.

IN THE CLAIMS:

Kindly replace Claims 1, 3, 5 and 6 as follows:

1. (Amended) A process for sterilizing a biologically contaminated enclosure in which the enclosure is brought into contact with formaldehyde, said formaldehyde being released from formalin by heat generated by an exothermic reaction occurring in the

presence of said formalin, the exothermic reaction being provided by addition of at least one reagent to said formalin in amounts sufficient to generate heat for releasing formaldehyde from said formalin, wherein said at least one reagent comprises a first reagent (A) and a second reagent (B), said reagent (A) comprising hexamethylenetetramine, and said second reagent (B) comprising a peroxide compound or a precursor thereof.

3. (Amended) A process of claim 1, wherein to evaporate formaldehyde gas from every 10 ml up to maximum 3500 ml of formalin there are 180 to 210 grams of hexamethylenetetramine.

5. (Amended) A process of claim 1, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

6. (Amended) A process of claim 1, wherein the formalin has a concentration of 10 to 40% formaldehyde gas.

Please add the following new Claims 7 to 20:

7. (New) A process for sterilizing a biologically contaminated enclosure in which the enclosure is brought into contact with formaldehyde, said formaldehyde being released from formalin by heat generated by an exothermic reaction occurring in the presence of said formalin, the exothermic reaction being provided by addition of at least one reagent to said formalin in amounts sufficient to generate heat for releasing

formaldehyde from said formalin, wherein said at least one reagent comprises a first reagent (A) and a second reagent (B), said reagent (A) comprising hexamethylenetetramine, in admixture with sulphur sublime, red iron oxide, silica and citric acid, and said second reagent (B) comprising a peroxide compound or a precursor thereof.

8. (New) A process of claim 2, wherein said reagent (B) comprises a hydrogen peroxide solution.

9. (New) A process of claim 2, wherein to evaporate formaldehyde gas from every 10 ml up to maximum 3500 ml of formalin 180 to 210 grams of hexamethylenetetramine.

10. (New) A process of claim 7, wherein to evaporate formaldehyde gas from every 10 ml up to maximum 3500 ml of formalin the following ranges of constituents of reagent (A) are utilized: up to 10 grams of sulphur sublime, up to 10 grams of red iron oxide, up to 5 grams silica, up to 5 grams of citric acid, and 180 to 210 grams of hexamethylenetetramine.

11. (New) A process of claim 2, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

12. (New) A process of claim 3, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

13. (New) A process of claim 4, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

14. (New) A process of claim 7, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

15. (New) A process of claim 8, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

16. (New) A process of claim 9, wherein the ratio between the reagents (A, B) is 0.7 to 1.5.

17. (New) A process of claim 2, wherein the formalin has a concentration of 10 to 40% formaldehyde gas.

18. (New) A process of claim 7, wherein the formalin has a concentration of 10 to 40% formaldehyde gas.

19. (New) A process of claim 8, wherein the formalin has a concentration of 10 to 40% formaldehyde gas.

20. (New) A process of claim 9, wherein the formalin has a concentration of 10 to 40% formaldehyde gas.

REMARKS

The present Amendment modifies the claim format and eliminates the use of multiple dependency.

The examination and allowance of the Application respectfully is requested.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: ______________________
Benton S. Duffett, Jr.
Registration No. 22,030

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: September 28, 2001

Attachment to Preliminary Amendment dated September 28, 2001

Marked-up Claims 1, 3, 5 and 6

1. (Amended) A process for sterilizing a biologically contaminated enclosure in which the enclosure is brought into contact with formaldehyde, said formaldehyde being released from formalin by heat generated by an exothermic reaction occurring in the presence of said formalin, the exothermic reaction being provided by addition of at least one reagent to said formalin in amounts sufficient to generate heat for releasing formaldehyde from said formalin, [characterized in that] wherein said at least one reagent comprises a first reagent (A) and a second reagent (B), said reagent (A) comprising hexamethylenetetramine, [optionally in admixture with sulphur sublime, red iron oxide, silica and citric acid,] and said second reagent (B) comprising a peroxide compound or a precursor thereof.

3. (Amended) A process of [any one of claims 1-2] claim 1, wherein to evaporate formaldehyde gas from every 10 ml up to maximum 3500 ml of formalin [the following ranges of constituents of reagent (A) are needed: (0-10) grams of sulphur sublime, (0-10) grams of red iron oxide, (0-5) grams silica, (0-5) grams of citric acid and (180-210)] there are 180 to 210 grams of hexamethylenetetramine.

5. (Amended) A process of [any one of claims 1-4] claim 1, wherein the ratio between the reagents (A, B) is [0.7-1.5] 0.7 to 1.5.

Attachment to Preliminary Amendment dated September 28, 2001

Marked-up Claims 1, 3, 5 and 6

6. (Amended) A process of [any one of claims 1-5] claim 1, wherein the formalin has a concentration of [10-40] 10 to 40% formaldehyde gas.

A PROCESS FOR STERILIZING A BIOLOGICALLY CONTAMINATED ENCLOSURE

The present invention relates to a process for sterilizing a biologically contaminated enclosure and particularly to a safe and easy chemical process for a well-controlled release or fumigation of formaldehyde gas from formalin. The process is intended for sterilizing biologically contaminated enclosures such as animal houses, hatcheries, feed stores, feed bins, feed tanks, feed mills, hospitals, medical instruments or other hard to reach areas in which the slowly and well controlled release of formaldehyde gas from easily available formalin solution is responsible for the complete sterilization by maximizing the excellent killing effects against bacteria, viruses and fungi.

BACKGROUND OF THE INVENTION

Discussion of related art

It is well known that formaldehyde gas is the mostly used gas in the sterilization of livestock buildings. It is an effective disinfectant against vegetative bacteria, fungi, spores and viruses if an adequate time of exposure and not less than 70% humidity are provided (Remington page 1171, Cooper & Mason 1964).

It can be easily absorbed by surfaces in both its gaseous or liquid state, as it has strong penetration power which increases in completely closed spaces. In a study (Sykes, 1972) it was proved that formaldehyde can attain complete sterilization to a well closed room within two hours at 70% relative humidity.

Its mode of action on living cells is by reaction with the cellular protein and (DNA, RNA) amino acids (Russel, 1976).

Formalin, as a commercially available product, is an aqueous solution containing up to 37% by weight of formaldehyde, HCHO (30.03), with methanol added to prevent

polymerization. The solution is extensively used for disinfecting rooms, which have been subjected to infection, by:

1. Reaction of formalin with half its weight of potassium permanganate.

2. Spraying it on sheets hung in the room.

3. Releasing formaldehyde vapor from formalin into the room by a heat generator or heater.

4. Subliming paraformaldehyde powder at 218°C using a heater.

There are disclosed in WO 97/23247 A1 antiperspirant pads which are impregnated with hexamethylenetetramine in an acidic or neutral medium for releasing formaldehyde.

From STN International, File Caplus, Accession no. 1985:492906, Document no. 103:92906, RO 85306 B, it is known to disinfect technological spaces by using formaldehyde which is rapidly released from a formalin solution by a strong exothermic reaction due to the addition of $KMnO_4$.

In US patent no. 4356179 formaldehyde products are used as agricultural fungicides. The products can for example be obtained by adding hexamethylenetetramine to formaldehyde.

All the above mentioned methods have many disadvantages. Using potassium permanganate to evaporate formaldehyde results in a very vigorous and dangerous reaction, which is completed within few seconds, and this does not give enough time for the worker to escape safely and many fatal accidents have been reported in real life.

It can be proved that spraying formalin on sheets is non-reproducible and does not release enough formaldehyde gas as it is temperature-dependent as can be seen from the following table

Concentration and type of formaldehyde	Time needed to kill spores	Time needed to kill bacteria
Formaldehyde gas	2 hours	2 hours
8% formalin	18 hours	18 hours
0.5% formalin	2-4 days	6-12 hours

Formaldehyde gas is thus described as being a sterilizing agent, while formalin (10% strength) is described as being an antiseptic agent; hence there is a need to use the formaldehyde gas as a sterilizer rather than using the formalin, as formalin is time consuming and requires diligent application through decontamination.

Reference: Remington's Pharmaceutical Sciences, 18th. Ed., pages 1171, 1470. Merck Index 11th Ed.

Further, contaminated, highly sophisticated electronic and dental equipment may be damaged by sterilizing liquid agents like those described in US Patent 31779 or by heat or autoclaving etc. US Patent 5552112 introduced a new method for sterilizing a metallic surgical instrument with microwave radiation but the method suffers from non-availability of microwave source to everyone and high cost. As mentioned in US Patent 5552112, gas sterilization with an ethylene oxide mixture is acceptable for both hanpieces and burs. However, this is impractical because of cost of equipment, long sterilization and aeration times involved, and cost of providing adequate protection for personnel. Alkaline glutaraldehyde (2%) as mentioned by Boucher in US Patent 3912450, is used to sterilize equipment, but it must be used for 10 hours to kill spore-forming organisms or tuberculosis microorganisms and is irritating to tissue.

Many workers could successfully release formaldehyde gas using generators or heaters and some patents have been published like US Patents: 4585624, 665794, 1837264, 2993832, 3694146, 3816074, 3898038 and 4166087. All these patents describe different apparatus systems for vaporiz-

ing formaldehyde and dispensing it into the enclosure to be sterilized for contact with contaminants. However, such methods suffer from high cost of instruments, maintenance, availability, complexity and restricted volume of formalin to be evaporated. No work has ever been known to use a safe chemical process for the evaporation of formaldehyde as an alternative for the unsafe usage of potassium permanganate or other conventional methods.

SUMMARY OF THE INVENTION

The present invention provides an ideal, chemical and safe process for releasing formaldehyde gas from a formalin solution by evaporation using heat generated by an exothermic reaction in order to simplify and optimize the use of formaldehyde gas in sterilizing closed spaces, like houses, buildings for housing animals, hospitals, operating rooms, stores, hotels, bath rooms or any object needing to be sterilized.

It is therefore an object of the present invention to provide a process for sterilizing enclosures, such as animal houses, hatcheries, feed stores, feed bins, feed tanks, feed hauling truck bins or tanks, feed mills or other hard to reach areas, or rooms in hospitals, clinics, research laboratories and the like by chemically releasing gaseous formaldehyde into the enclosure for contact with contaminants.

The present invention is based on the finding that the release of formaldehyde gas can be easily provided by heat generated by an exothermic reaction occurring in the presence of formalin. The released formaldehyde gas can be used for sterilizing closed spaces of the kind exemplified above. Exothermic chemical reactions involving various reagents are known to one skilled in the chemical art. In general, a chemist can chose any reagents for such exothermic reactions. Needless to say, it is advantageous to chose reagents, which are easily available and cheep. Once chosen the amounts of reagents sufficient to

generate heat for releasing gaseous formaldehyde for sterilization from formalin are easily determined by one skilled in the art. As an example of appropriate reagents there can be mentioned hexamethylenetetramine and peroxide compounds or precursors of peroxide compounds, which when mixed, and in the presence of formalin, bring about an exothermic reaction releasing formaldehyde gas for sterilizing.

According to the invention the exothermic reaction is provided by addition of reagents to the formalin in amounts sufficient to generate heat for releasing formaldehyde from the formalin. In accordance therewith, the reagents comprise a first reagent A and a second reagent B, said reagent A comprising hexamethylenetetramine, optionally in admixture with sulphur sublime, red iron oxide, silica, preferably that sold under the tradename Aerosil, and citric acid, and the second reagent B comprising a peroxide compound, such as hydrogen peroxide, or a precursor thereof.

According to a most preferred embodiment, the reagent A comprises Methenamine (hexamethylenetetramine) and the reagent B comprises a hydrogen peroxide solution. Mostly preferred, said solution contains 10-50% hydrogen peroxide.

In accordance with the present invention the formalin, for example having a concentration of 10-40% formaldehyde gas, is mixed with the reagent A comprising hexamethylenetetramine and the reagent B, for example hydrogen peroxide. As explained below, the temperature of the reaction solution will increase spontaneously by the exothermic chemical reaction and the production of formaldehyde gas starts effectively at 60°C. The temperature rises and release of formaldehyde gas reaches the maximum value at 90°C.

As non-limiting examples of peroxide compounds the following can be mentioned: ammonium peroxosulfate, potassium peroxodisulfate, hydrogen peroxide, acetyl perox-

ide, benzoyl peroxide and cumene hydroperoxide.

According to a most preferred embodiment, wherein said reagents comprise hexamethylenetetramine and hydrogen peroxide the ratio between these is within the range of 0.7-1.5.

DETAILED DESCRIPTION OF THE INVENTION:

The present invention is illustrated by the following example:

To evaporate 10 ml up to maximum 3500 ml (preferably 2000 ml) of formalin containing 10%-40% of formaldehyde gas in water:

The above formalin quantity is mixed with 100g-400g, preferably 200 g powder (A) which consists of five ingredients as follows:

Ingredient	Range in grams	Preferably in grams
Sulphur sublime	0-10	0.30
Iron oxide, red	0-10	0.30
"Aerosil"	0-5	0.40
Citric acid	0-5	4.00
Methenamine	180-210	195.00

In case of sterilizing highly sophisticated medical or dental instruments or other similar objects Methenamine (hexamethylenetetramine) without the rest of chemicals shown in the above table should be used.

After mixing the above quantity of powder (A) with the above amount of formalin, (100ml-400ml, best results with 200ml) liquid (B) is added.

It is the powder part, which controls the reaction, and provides enough time for the operator before the onset of the evaporation process.

Liquid (B) is hydrogen peroxide having a concentration of 10%-50% (best results with 50%). It is the heat generated by mixing powder (A) and liquid (B) which helps

in heating and evaporation or controlled fumigation of formalin.

After about five minutes, the temperature of the solution increases spontaneously by the exothermic chemical reaction and the production of formaldehyde gas starts effectively at 60° C. With the rise of the temperature of the exothermic reaction the evaporation of formaldehyde gas becomes very strong and reaches the maximum at 90° C (after about 10 minutes).

EXAMPLES:

Example 1:

In order to illustrate the invention the following non-limiting example is given:

A 4000 m^3 (10000 bird capacity) chicken house was chosen to be sterilized immediately after the complete evacuation of the building and before the new bird cycle. The house was left as such without further cleaning. Swabs were taken from different representative areas of the house (ceiling, flour etc.). All windows and openings were tightly closed. The house was humidified with water to obtain at least 70% relative humidity. The chosen formalin amount for the experiment was 2 lit per 100m^3, so 40 lit of (37%) formaldehyde solution were divided into 20 plastic containers (10 lit capacity each) such that each container contains 2 lit of formalin. The containers were placed evenly in the house. To each container 200 g of powder (A) were added and consisting of:

Ingredient	Quantity (g)
Sulfur Sublime	0.30
Iron oxide, red	0.30
"Aerosil"	0.40
Citric acid	4.00
Methenamine	195.00
TOTAL	200.00

Powder (A) was mixed thoroughly with formalin and thereafter 200 ml of liquid (B) (50% hydrogen peroxide) were added to every container and mixed.

In every container solution temperatures were recorded against time, and the following average solution temperatures were obtained against time.

Time in minutes	Solution Temperature °C
3	40
5	60
7	80
10	95
30	95
40	85
50	75
60	65
100	40

Formaldehyde started evaporating effectively when the temperature of the solution reached 60° C after 5 minutes of mixing all ingredients together.

After 10 minutes the evaporation became extensive (boiling).

This temperature was attained for 20 minutes before it declined and reached room temperature after two hours.

The chicken house was kept closed and empty for 48 hours after which it was well ventilated and swabs were taken again randomly and analyzed for total fungal and bacterial count.

Average count before sterilization	Average count after sterilization
1000,000 colonies/g	2 colonies/g

Example 2:

Calculate the size of the house and then put in separate containers (20 liters capacity) two liters of Formalin for each 100 cubic metre. Add 200 g of reagent A by mixing with the standard Formalin in all containers; steer the mix after adding the powder until it is com-

pletely dissolved, then add 200 ml of Reagent B to the mixture and leave the house. After five minutes evaporation starts and the release of formaldehyde gas continue for more than four hours and it is preferable to keep the house closed overnight. The production of formaldehyde gas starts effectively at 60°C. The evaporation becomes very strong and reaches the maximum at 90°C after 10 minutes. Fumigation works best at temperatures above 18°C, therefore the house temperature should be maintained above this level and the humidity should be around 70%. The composition of reagent A is sulphur, iron oxide, dicalcium phosphate and hexamethylenetetramine. Reagent A controls the formaline evaporation reaction and provides a suitable time before the onset of evaporation. Reagent B is a liquid comprising 50% hydrogen peroxide which is sufficient to evaporate two litres of 37% formalin solution. Reagent B assists in heating and functions as a catalyst for evaporation of formalin.

Reagent A is to be kept in a cool place at a temperature below 30°C, out of reach of children and feed stock places. Reagent B is also to be kept in a cool place at a temperature below 30°C, out of reach of children and feed stock places.

Example 3:

The procedure of this example was carried out in the same manner as in example 2 with the exception of that the composition of reagent A is 100% hexamethylenetetramine powder. The results of this experiment were also excellent as in the aforementioned experiments.

The present invention, therefore, is well suited and adapted to attain the intended objects and has the advantages and features mentioned as well as others inherent therein. The foregoing description is provided to illustrate the invention, and is not to be construed as a limitation.

REFERENCES

1. Russell, A.D. 1976 . Inactivation of non-sporing bacteria by gases. SOC.APPL.Bacterial., 5, 61-68.

2. Cooper, E.A., and Mason, J. 1964. Studies of selective bactericidal action. J.HYG, 26, 118-126.

3. Sykes, M.K. 1972 . Sterilization of ventilators. Int. Anesthesiol. Clin., 10, 131.

4. Pharmaceutical CODEX. 1976.

5. Martindale, 1989.

6. Remington, 1990.

7. Disinfection, Sterilization and preservation 1983 third edition, Seymor S. Block.

8. Poultry Production. Sunil Kumar Das, 1994 First edition.

CLAIMS

1. A process for sterilizing a biologically contaminated enclosure in which the enclosure is brought into contact with formaldehyde, said formaldehyde being released from formalin by heat generated by an exothermic reaction occurring in the presence of said formalin, the exothermic reaction being provided by addition of at least one reagent to said formalin in amounts sufficient to generate heat for releasing formaldehyde from said formalin, characterized in that said at least one reagent comprises a first reagent (A) and a second reagent (B), said reagent (A) comprising hexamethylenetetramine, optionally in admixture with sulphur sublime, red iron oxide, silica and citric acid, and said second reagent (B) comprising a peroxide compound or a precursor thereof.

2. A process of claim 1, wherein said reagent (B) comprises a hydrogen peroxide solution.

3. A process of any one of claims 1-2, wherein to evaporate formaldehyde gas from every 10 ml up to maximum 3500 ml of formalin the following ranges of constituents of reagent (A) are needed: (0-10) grams of sulphur sublime, (0-10) grams of red iron oxide, (0-5) grams of silica, (0-5) grams of citric acid and (180-210) grams of hexamethylenetetramine.

4. A process of claim 2, wherein the solution contains 10-50% hydrogen peroxide.

5. A process of any one of claims 1-4, wherein the ratio between the reagents (A, B) is 0.7-1.5.

6. A process of any one of claims 1-5, wherein the formalin has a concentration of 10-40% formaldehyde gas.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to Provisional and PCT International Applications)	Attorney's Docket No. 003300-852

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name;
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A PROCESS FOR STERILIZING A BIOLOGICALLY CONTAMINATED ENCLOSURE

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application
Number _____
on _____
and was amended
on _____ (if applicable).

☐ was filed as PCT international application
Number _____
on _____
and was amended
on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
Sweden	9901137-1	29 March 1999	X Yes _No
			_Yes _No
			_Yes _No
			_Yes _No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

_____ _____
(Application Number) (Filing Date)

_____ _____
(Application Number) (Filing Date)

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED)
(Includes Reference to Provisional and PCT International Applications)

Attorney's Docket No. 003300-852

I hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations §1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS *(check one)*		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NUMBERS ASSIGNED (if any)			
SE00/00597	28 March 2000				

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

William L. Mathis	17,337	R. Danny Huntington	27,903	Gerald F. Swiss	30,113
Robert S. Swecker	19,885	Eric H. Weisblatt	30,505	Michael J. Ure	33,089
Platon N. Mandros	22,124	James W. Peterson	26,057	Charles F. Wieland III	33,096
Benton S. Duffett, Jr.	22,030	Teresa Stanek Rea	30,427	Bruce T. Wieder	33,815
Norman H. Stepno	22,716	Robert E. Krebs	25,885	Todd R. Walters	34,040
Ronald L. Grudziecki	24,970	William C. Rowland	30,888	Ronni S. Jillions	31,979
Frederick G. Michaud, Jr.	26,003	T. Gene Dillahunty	25,423	Harold R. Brown III	36,341
Alan E. Kopecki	25,813	Patrick C. Keane	32,858	Allen R. Baum	36,086
Regis E. Slutter	26,999	Bruce J. Boggs, Jr.	32,344	Steven M. du Bois	35,023
Samuel C. Miller, III	27,360	William H. Benz	25,952	Brian P. O'Shaughnessy	32,747
Robert G. Mukai	28,531	Peter K. Skiff	31,917		
George A. Hovanec, Jr.	28,223	Richard J. McGrath	29,195		
James A. LaBarre	28,632	Matthew L. Schneider	32,814		
E. Joseph Gess	28,510	Michael G. Savage	32,596		

21839

and: None

Address all correspondence to:

21839

Benton S. Duffett, Jr.
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, Virginia 22313-1404

Address all telephone calls to: Benton S. Duffett, Jr. at (703) 836-6620.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(10/99

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED) (Includes Reference to Provisional and PCT International Applications)	ATTORNEY'S DOCKET NO. 003300-852

FULL NAME OF SOLE OR FIRST INVENTOR	SIGNATURE	DATE
Shoaa Abdul RAHMAN		20 Nov 2001

RESIDENCE	CITIZENSHIP
Lund, Sweden SEX	Jordan

POST OFFICE ADDRESS
Kämpagränden 23B, 224 76 LUND, SWEDEN

FULL NAME OF SECOND JOINT INVENTOR, IF ANY	SIGNATURE	DATE
Raáfat KILTANEH		20 Nov 2001

RESIDENCE	CITIZENSHIP
AMMAN, JORDAN SOX	Jordan

POST OFFICE ADDRESS
Wadi saqra St.-Kalbona Building, 6th Floor, Flat No. 7, AMMAN, JORDAN

FULL NAME OF THIRD JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF FOURTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF FIFTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF SIXTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF SEVENTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF EIGHTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS

FULL NAME OF NINTH JOINT INVENTOR, IF ANY	SIGNATURE	DATE

RESIDENCE	CITIZENSHIP

POST OFFICE ADDRESS